TENNESSEE HIGHER EDUCATION COMMISSION

Agenda Item: I.A.8.

DATE: July 14, 2005

SUBJECT: East Tennessee State University, Bachelor of Science (B.S.) in Geology

ACTION RECOMMENDED: Approval

BACKGROUND INFORMATION: In 1997, ETSU phased out a B.S. in Geology, phased out a B.A. in Geology in 1999 and added it as a concentration under Geography. In 2004 the concentration was moved to Physics after the discovery of the Gray Fossil Site and establishing the Center of Excellence in Paleontology. With this discovery, the complex geology of the local area provides a "natural laboratory" for training students in a field-based geology program, enabling students to acquire the skills necessary to successfully solve a variety of geologic problems that they will encounter in a career as a professional geologist. The B.S. in Geology will provide students with a major to study in their area of interest, and will enhance students' ability to gain employment or pursue further graduate education. The Gray Fossil Site and the affiliated Center of Excellence will provide innovative teaching and research opportunities for students in the new Geology major that are unavailable at any other institution in the United States.

The objective of the proposed program is to replace the Geology concentration in the Department of Physics, Astronomy and Geology with a Geology major. This will be achieved through modification of existing Geology courses within the concentration curriculum. In addition to preparing students to pursue careers as professional geologists or graduate level study, the proposed program is designed to provide students with an understanding of the methods of science and scientific research through the geological sciences, the knowledge essential to educate others in the geological sciences, and promote awareness of the geological sciences to the public.

PROPOSED START-UP DATE: Fall 2005

Commission staff has reviewed program proposals according to the academic standards adopted by the Commission on November 14, 2002. Each standard is referenced below.

1.1.20A MISSION: The proposed program is consistent with the role and scope of the mission of the institution to serve the state, region and nation.

1.1.20B CURRICULUM: Courses are currently offered by the concentration; therefore, no new courses are required to implement the programs. The proposed curriculum requires 120 semester credit hours, distributed as follows:

Curriculum Components	Credit Hours
General Education	24
Major Field Core	42
Geology Electives	8
Electives	8
Additional Math/Science	20
Minor	18
TOTAL	120

1.1.20C ACADEMIC STANDARDS: Admission, retention, and graduation policy for the proposed B.S. in Geology will be consistent with those for other baccalaureate degrees as published in the *Undergraduate Catalog*.

Projected Program Productivity

Student Projections	Full-time Enrollment	Part-time	Graduates
Year 1	10	4	0
Year 2	12	6	2
Year 3	14	8	4
Year 4	16	8	5
Year 5	16	8	5

1.1.20D FACULTY: The Geology faculty currently consists of three full-time faculty members with terminal degrees. Another tenure-track position at the assistant professor level is scheduled to be filled in August 2005. In addition, ETSU has one full time lecturer, one adjunct lecturer, and one full-time, non-teaching position within the Center of Excellence in Paleontology. The teaching faculty is sufficient to deliver the courses required for the major; additional part-time faculty would be provided to cover additional sections, if warranted by future student demand for introductory level courses.

1.1.20E LIBRARY RESOURCES: The library recently acquired GEOREF, a geology-specific citation search engine that is invaluable to faculty and students alike. The library holdings with respect to Geoscience journals are incomplete, as many Geoscience journals have been discontinued. The current E-journal selections, together with an excellent interlibrary loan service, satisfactorily fill most gaps. With an emphasis on energy and environmental issues in geology, subscriptions, journals will be requested in the amount of $3000 annually.

1.1.20F ADMINISTRATION/ORGANIZATION: The proposed program will be housed in the College of Arts and Sciences, Department of Physics, Astronomy and Geology.

1.1.20G SUPPORT RESOURCES: None indicated.

1.1.20H FACILITIES/INSTRUCTIONAL EQUIPMENT: Instructional facilities are adequate, but renovation is needed for a Rock Preparation Laboratory at an estimated cost of $8,000. Teaching laboratory and field equipment needs for the existing Geology concentration in Physics and the proposed new degree program total approximately

$45,000. This equipment will be considered for purchase with one-time funds as they become available from the existing ETSU budget. Access to a computer laboratory will be organized through the campus Office of Instructional Technology and will utilize existing computer lab facilities and resources.

1.1.20I STUDENT/EMPLOYER DEMANDS: Statistics from the American Geological Institute (2001) and the Bureau of Labor Statistics (2003) indicate an increasing demand for geologists in the coming 5-10 years. Opportunities for environmental geologists will continue to grow with the need for compliance with federal and state regulations concerning ground water, water conservation, waste disposal, and geological hazards. Although the petroleum industry experienced large cyclical employment fluctuations in the past, recent employment trends have been more stable. Both the AGI and the BLS report that the aging and retirement of the current workforce in all sub-disciplines of geology will increase the number of geologists needed in the next 5-10 years. Since enrollments in Geology programs decreased drastically following the energy crisis of the 1980s, the AGI report predicts that the number of jobs for geologists will exceed the number of geology students available to fill them.

Employment trends for geologists tend to mirror societal needs. Continuing population growth in our state, as well as the nation, will increase the need for geologists to address environmental concerns, to perform risk assessment of geological hazards such as flooding and earthquakes, and to satisfy the increasing demands for energy resources. The northeastern region of the state is also undergoing strong growth that requires a pool of well-trained geologists that can advise the community as it seeks to make sound and reasoned decisions regarding future development. The complex geology of northeastern Tennessee controls the location of communities, roads, dams, tunnels and buildings in the area, as well as the supply and quality of community water supplies, the viability of mining resources and issues such as slope stability. A strong Geology program at ETSU will provide a pool of professionals trained in the area and capable of providing the needed expertise. It will also increase public awareness of geologic issues in general.

1.1.20J NO UNNECESSARY DUPLICATION: The state of Tennessee currently has seven public and two private institutions that offer a B.S. degree in Geology or Earth Sciences. The closest institution to ETSU that currently offers a B.S. degree is the University of Tennessee Knoxville, located over 100 miles away.

1.1.20K COOPERATIVE INSTITUTIONS: The Gray Fossil and the Center of Excellence in Paleontology will provide unique teaching and research opportunities for students in a Geology program at ETSU that are unavailable elsewhere in the state.

1.1.20L DESEGREGATION: The program will not impede the state's effort to achieve racial diversity.

1.1.20M ASSESSMENT/EVALUATION AND ACCREDITATION: There is no accreditation agency for Geology programs and there are no SACS implications. The success of the program will be measured by the number of graduates in Geology that become gainfully employed as geologists or continue their academic studies at the

graduate level. Alumni surveys would be used for evaluating the success of the Geology degree program. The Department of Physics, Astronomy and Geology also will track and record the academic and professional careers of graduates from the program on an annual basis.

1.1.20N ARTICULATION: N/A

1.1.20O EXTERNAL JUDGMENT (Graduate Programs): N/A

1.1.20P COST/BENEFIT/SOURCE: Since no other equivalent-aged deposits exist in the eastern United States, incorporating the Gray Fossil Site as a research and teaching tool will provide a unique opportunity to study and understand the geological evolution of eastern North America, and more importantly, to reconstruct climate changes that occurred 4.5-7.0 million years ago. Their work is important in the debate on current global warming continues. This site has the capability of producing a unique high fidelity climate record that will help place modern rates of climate change in context. There are minimum costs associated with the implementation of the proposed program, all of which will be addressed though one-time campus allocations or external grants. The resources dedicated to support the concentration will be directed to the major.

Financial projections:

	Year 1	Year 2	Year 3	Year 4	Year 5
Expenditures					
A. One – time:					
New/renovated space	$8,000				
Equipment	$25,000	$20,000			
B. Recurring:					
Equipment					
Library	$3,000	$3,000	$3,000	$3,000	$3,000
Travel	$2,000	$2,000	$2,000	$2,000	$2,000
Other (operating costs)	$14,000	$14,000	$14,000	$14,000	$14,000
TOTAL (A + B)	$**52,000**	$**39,000**	$**19,000**	$**19,000**	$**19,000**
Revenues					
State appropriations (new FTE)					
State appropriations	$11,000	$11,000	$11,000	$11,000	$11,000
(old)****	$8,000	$8,000	$8,000	$8,000	$8,000
Tuition/Fees***	$8,000*				
Institutional Resources	$25,000**	$20,000**	_____	_____	_____
TOTAL REVENUES	$**52,000**	$**39,000**	$**19,000**	$**19,000**	$**19,000**

* Renovation will be supported from ETSU's existing annual renovation budget.
**Equipment will be purchased using one-time funds from existing ETSU budget only as they become available.
***In addition to regular tuition and fees, the department has submitted a request to establish a materials fee in Geology. The request for a $20 per course fee would generate approximately $8000 per year, which would cover the costs of consumables in Geology courses.

****The old state appropriation includes the existing supply budget for the program ($6,000) and $5,000 to be reallocated in the academic affairs budget to provide new recurring library and travel costs.

1.1.30 POST APPROVAL MONITORING: An annual performance review of the proposed program will be conducted for the first five years following approval. The review will be based on goals established in the approved program proposal. At the end of this period, campus, governing board, and Commission staff will perform a summative evaluation. These goals include, but are not limited to enrollment and graduation numbers, program costs, progress toward accreditation, library acquisitions, student performance and other goals set by the institution and agreed upon by governing board and Commission staff. As a result of this evaluation, if the program is found to be deficient, the Commission may recommend that the governing board terminate the program. Copies of such recommendation will be forwarded to the Education Committees of the General Assembly. The Commission may also choose to extend this period if additional time is needed and requested by the governing board.